



# Earth Science Technology Office

---

## Technology Infusion Plan

Presented to :  
ESE Technology Strategy Team  
November 27, 2001

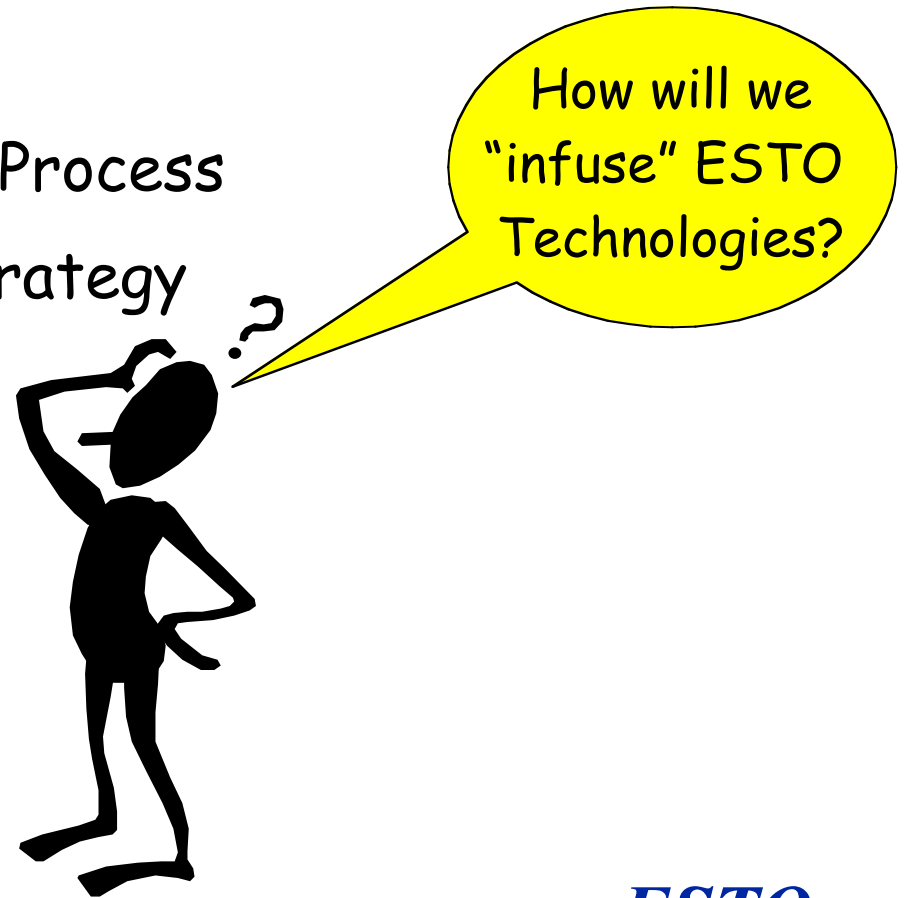
Janice L. Buckner  
[janice.buckner@gsfc.nasa.gov](mailto:janice.buckner@gsfc.nasa.gov)



# Agenda

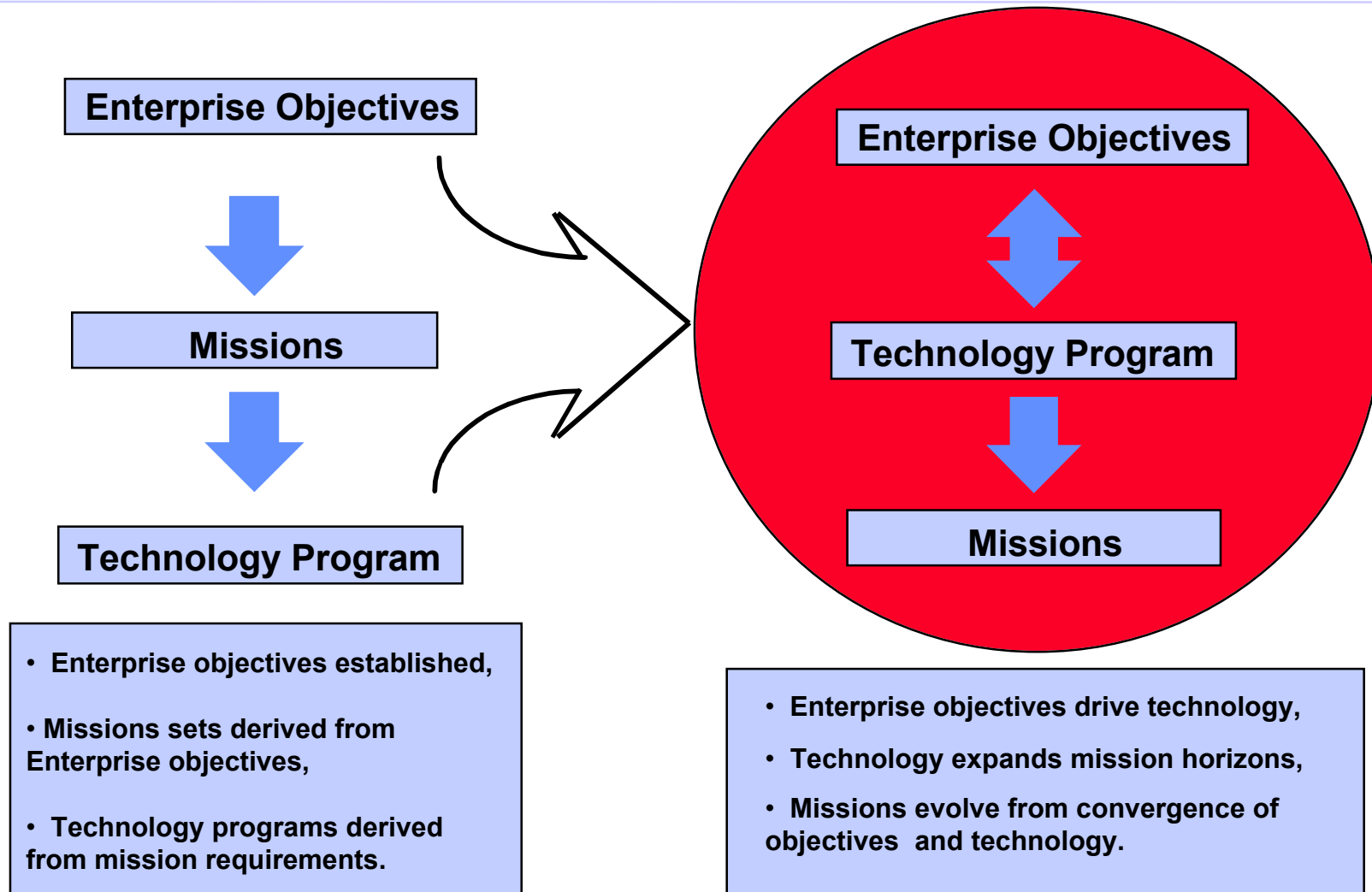
---

- Background
- Scope of Infusion Plan
- Technology Maturation Process
- Technology Infusion Strategy
- Next Steps





# Background





# Scope

---

## ESTO Infusion Plan:

- Documents the technology infusion strategy for the Earth Science Enterprise,
- Describes the strategy used by ESTO to infuse new technologies into User Communities to enable future ESE measurements,
- Is required by the HOWI-7120-Y003, *Formulate and Approve Flight Missions*,
- Is prepared by ESTO, with input from the Technology Strategy Team members, for OES Lead Technologist approval.



# Technology Maturation Process

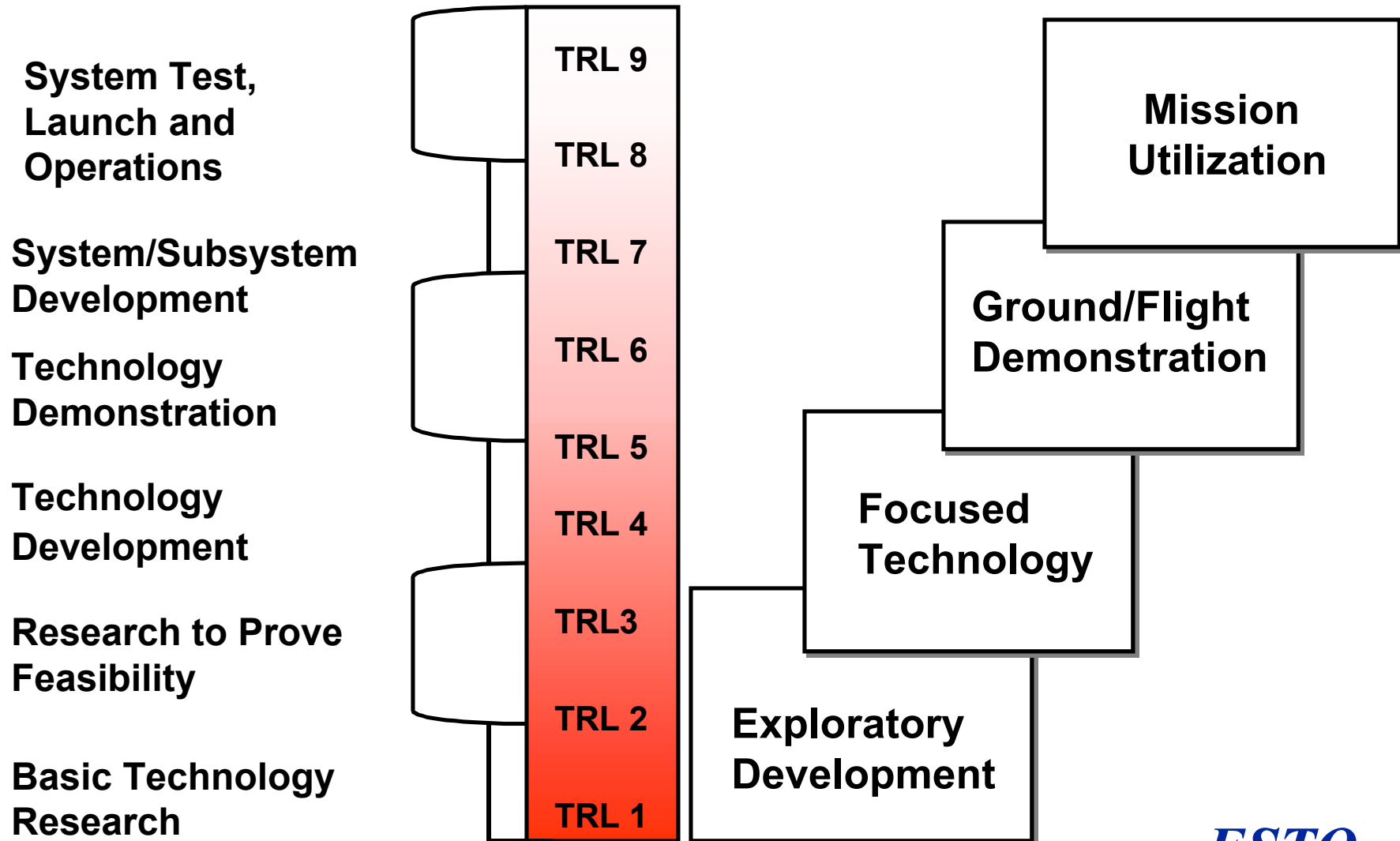
---

**Successful infusion of technology into flight missions is a process that begins with the maturation of new technologies.**

- Early phases of successful infusion of advanced technologies are facilitated by a series of formal and informal interactions between scientific PI's , technology providers, and mission developers
- Joint activities and partnerships with universities, industry, and other government agencies are particularly important to the advancement , integration and infusion of advanced technology capabilities
- Partnerships permit the OES to:
  - ✓ Leverage funds to cross-fertilize ideas from different applications
  - ✓ Pursue different approaches simultaneously in order that the most advanced technology can be identified quickly
- The process of technology maturation is a continuous one, where technology matures at all TRL levels



# Technology Maturation Process

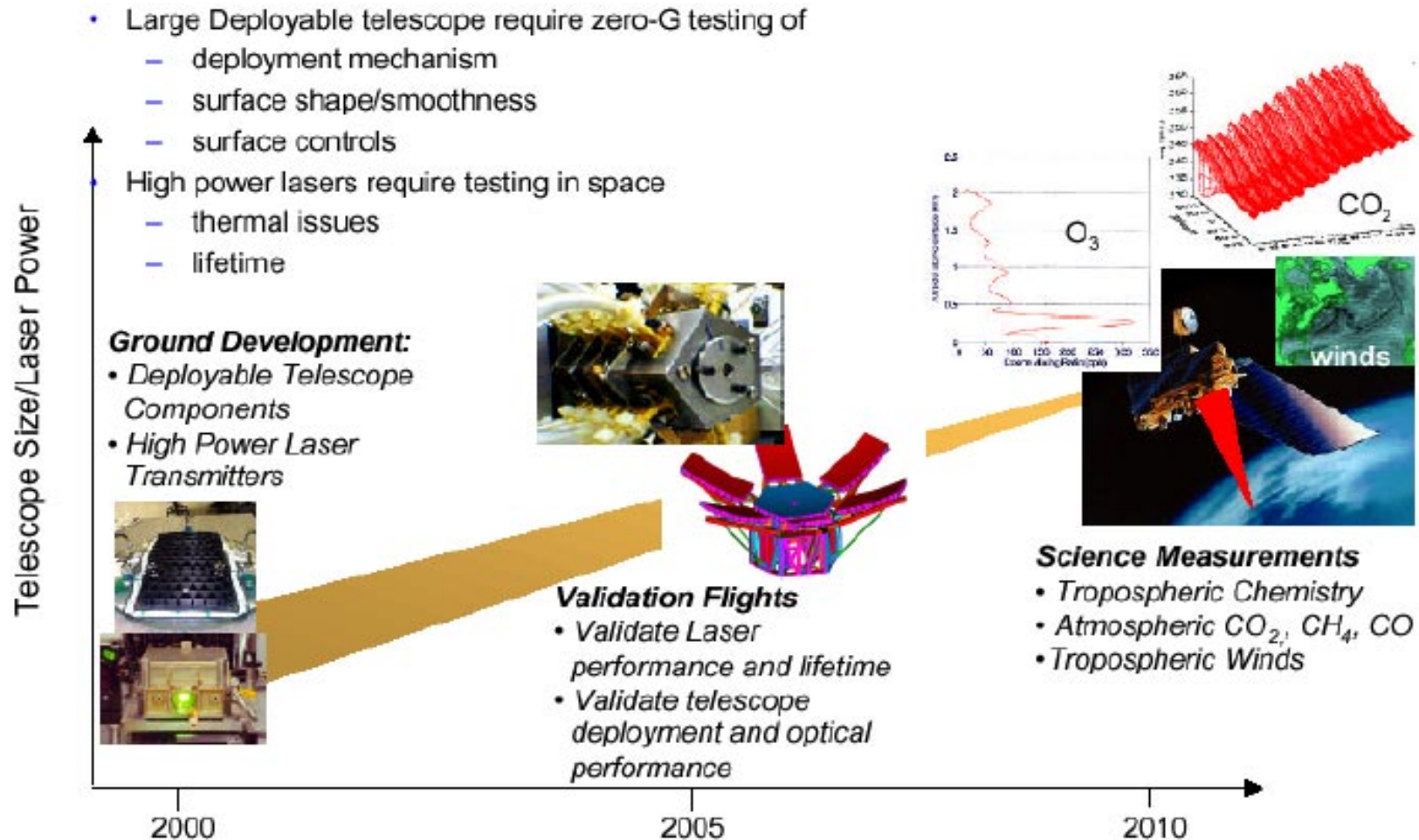




# Technology Infusion Strategy

## Identification of Technologies Under Development

### Technology Roadmapping





# Technology Infusion Strategy

## Identification of Technologies Under Development

### ESTO Liaison to Mission Formulation Teams



- Knowledgeable about mission requirements,
- Identifies key technologies for reducing cost, enabling mission objectives.





# Technology Infusion Strategy

## Broad Dissemination of Technology to User Communities

---

### Annual Earth Science Technology Conference

- Provides an opportunity for the ESE user community to meet, review progress, and share results of technology research.
- Participants include NASA, Industry, Academia, Scientists, Instrument and Spacecraft Designers, Advanced Information Specialists, and Technology Developers.
- Enables visibility to all prospective technology users, and an open forum for collaboration.





# Technology Infusion Strategy

## Broad Dissemination of Technology to User Communities

---

### ESTO eMagazine

- Annual publication on ESTO homepage
- Feature articles
  - ✱ Promising new technology investments,
  - ✱ Successful flight demonstrations,
  - ✱ New IT capabilities,
  - ✱ Technology Infusion Success Stories !





# Technology Infusion Strategy

## Broad Dissemination of Technology to User Communities

### Technology Managed by Potential Users



- After a competitive solicitation process ESTO assigns winning proposals to the technologically appropriate and/or participating Center.
- This moves the direct technology management out to the potential user community, so as to provide:
  - ✓ Cognizance and familiarization with the technology,
  - ✓ Hands-on involvement,
  - ✓ Helps to create a link for potential infusion into future technology applications.



# Technology Infusion Strategy

## Assessment of Technologies

---

### Technology Infusion Opportunity

- Each year ESTO shall publish a technology infusion table of opportunities,
- The table will contain a list all IIP, AIST, and ACT currently funded technology development programs,
- The maturity of each technology development will have a TRL from 1 to 6,
- The table will be updated annually at the completion of the ES Annual Technology Conference,
- The table can be found in the appendix of the ES Technology Infusion Plan and on the ESTO homepage,
- ESTO refers to the table as the **Technology Infusion Opportunity**.



# Associated Risk of Incorporation

---

## Technology Risk Mitigation Approach

- ESTO works with the potential user to ensure that each technology is appropriately validated such that the remaining risk associated with its first use is acceptable, not only to the proposer, but also to review committees,
- Technology validation will allow the ES user community to have confidence in the new technology,
- As a result, the user will have the ability to incorporate it into a proposal because they can anticipate that a review committee will embrace the technology risk,
- Some full-up , operational validation in space environment may be required to return unacceptable levels of risk,
- Technology readiness, including performance verification and appropriate validation test results, will be well documented and made easily available to both the end user and the reviewer community.



# Summary

---

## Keys to Technology Infusion



- Formal and in formal interactions during technology maturation,
- Partnerships with universities, industry, and other government agencies,
- Roadmapping,
- Liaisons with ES Formulation Teams,
- Annual ES Technology Conference/ Technology Reports,
- Success Story publication ( eMagazine),
- Technology Managed by Potential Users,
- User-friendly Technology Inventories,
- Good technology assessment techniques,
- Annual Technology Infusion Opportunity,
- Technology Risk Mitigation.



# Next Steps

---

- ❑ Obtain OES Lead Technologist approval of plan,
- ❑ Implement the plan,
- ❑ Update Technology Opportunity annually.